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Nativity and Nutritional Behaviors in the Mexican Origin Population Living in the US-Mexico Border Region

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Abstract

Background—The purpose of this study is to determine the relationship between nativity and nutritional behaviors and beliefs in the Mexican American population living in the South Texas border region.

Methods—Mexican Americans living the border region of South Texas were sampled to assess their nutrition behaviors and beliefs. Nativity was measured as whether subjects were born in the United States or Mexico. Nutritional behaviors were measured using the SPAN and indexes were used to measure barriers to good nutrition, dietary self-efficacy, and dietary importance. OLS regression analysis was used and adjustments were made for sociodemographic factors.

Results—Differences between U.S. born Mexican Americans and Mexico born Mexican Americans existed in nutritional beliefs, but not in behaviors. Mexico born Mexican Americans reported their dietary choices as more important and reported greater food self-efficacy than their U.S. born Mexican American counterparts. Socioeconomic status influenced U.S. born Mexican Americans nutritional beliefs only and the same effect was not observed for Mexico born Mexican Americans.

Discussion—Despite low levels of overall acculturation in the border region dietary beliefs still exist between immigrants and US born Mexican Americans in dietary beliefs, but, not behaviors in U.S. born Mexican Americans.

Keywords

Mexican Americans; immigration; nutrition; beliefs; behaviors

Introduction

The past twenty years has been met with dramatic increase of obesity in the US population. Obesity has grown at such an alarming rate that most states report that one in four adults is classified as obese [1]. Obesity has been linked to a number of diseases and health conditions including coronary heart disease, cancer and type II diabetes [2] Similar to the nation as a whole, Hispanics are also obese and plagued by its associated health conditions. In fact, over 67% of Hispanics in the US are currently overweight or obese and 7% have been diagnosed with type 2 diabetes [1].

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As immigrants adapt to their new homelands, they are forced to adjust aspects of their behavior in order to successfully navigate the demands of the new culture. For Mexicans, as this acculturation process takes place, many adopt eating habits consistent with the "American diet". Consequently, acculturation has been linked to obesity and diabetes amongst Hispanics [3-4]. However, because the Texas border region is characterized by a Hispanic majority, large numbers of Spanish speaking individuals and greater than average Mexican-born immigrants, its residents may not be forced to choose between American and Mexican values, behaviors, or food choices to the same extent as their counterparts in other regions of the US. This dynamic presents unusual circumstances in which we are able to observe the effects of residence in the United States in a region that does not resemble the mainstream. Although previous research has established the connection between acculturation and obesity, little research has focused on border regions that are culturally distinct from the rest of the United States, such as the Rio Grande Valley.

Along with acculturation, socioeconomic status has also been shown to influence healthy energy balance [5], fruit and vegetable consumption, fiber intake, sugar intake and fat intake in various populations [6-9]. Additionally, social norms and social influences have been linked to fruit and vegetable consumption [10]. More specifically, social support has been linked to increased healthy eating and weight monitoring [11]. Previous findings also show that individuals with higher dietary self-efficacy hold more positive expectations about goal setting, planning, and monitoring fat, fiber, and vegetable intake [12]. Furthermore, O'Dea & Wilson [13] reported that dietary self-efficacy emerged as a predictor of BMI. Thus, it is apparent that SES, social support, and self-efficacy must be considered when assessing factors contributing to healthy dietary behaviors.

This study aims to provide greater insight to social and interpersonal factors that explain the high prevalence of obesity in an area of the United States so heavily influenced by Mexican culture and beliefs. The need to examine dietary habits in relation to acculturation in a Mexican origin population is yet to be well defined. Since other studies have failed to find a consistent relationship between acculturation and diet in Mexican Americans, we implement a new approach by using a sample of Mexican origin individuals (U.S. born Mexican Americans and Mexico born Mexican Americans) living along the US-Mexico border region of the Rio Grande Valley focusing on country of birth rather than language. Presumably, this sample is the least acculturated of the Mexican origin population living in the United States, and may therefore provide a better understanding of the association between acculturation and diet for immigrants coming from Mexico. We hypothesize that if the differences between US born and Mexico born Mexican Americans is a function of acculturation then there should not be a difference between Mexican immigrant and U.S. born Mexican American behaviors and beliefs regarding food. Additionally, if social support and socioeconomics are aspects of the acculturation process that influence dietary behaviors in immigrants, then Mexico born Mexican Americans and US born Mexican Americans will differ.

Method

Participants

This study was a secondary data analysis of a survey of 398 randomly selected households from neighborhoods in Brownsville, TX and Laredo, TX from January 2005 to October 2006. Households were selected by randomly identifying a geographical beginning point, navigational direction and household and then proceeding to survey subsequent households in the same direction. Each neighborhood contained under 1500 homes. An adult in the household was randomly identified by asking for one adult member of the household aged between 20 and 65 years with the nearest birthday to participate in the survey. Over 99% of

surveys were conducted in Spanish. The response rate in Brownsville was 87.6%, and a 90.9% response rate was achieved in Laredo.

Materials

The *Tu Salud Si Cuenta* (“Your Health Counts”) (TSSC) questionnaire was designed to evaluate the effectiveness of a media campaign that targeted physical activity and nutrition. The TSSC questionnaire includes questions on demographic characteristics, employment status, self-rated health, self-reported physical activity, perceived barriers, attitude, and self-efficacy towards physical activity, perceived barriers, attitude, and self-efficacy towards healthful food choices, and evaluation of a local media campaign. It is a 79-item questionnaire that includes items extracted from the Behavioral Risk Factor Surveillance Survey (BRFSS) and from the National Health and Nutrition Examination Survey (NHANES) used by the Centers for Disease Control and Prevention (CDC). Additionally, it is modeled after the School Physical Activity and Nutrition (SPAN) questionnaire shown to have acceptable reproducibility and similar or better validity than other food assessment instruments written at a readability level appropriate to the population under study (between a fourth and eighth grade) (Hoelscher et al 2003). Reproducibility results for the food intake items from the SPAN test-retest study were 47-92% agreement, 0.30-0.56 Kappa statistics, and 0.32-0.68 correlations (Hoelscher et al., 2003). Twenty-one of the 24 SPAN nutritional intake questions were selected for this study because these foods assessed are commonly eaten among the population.[14].

All items underwent forward/backward translation. To ensure that this questionnaire was appropriate for the priority population of adult Mexican-American residents along the border, the questionnaire was reviewed for cultural and linguistic appropriateness as well as for literacy level. This study was approved by the University Internal Review Board.

Variable Measurement

Nutrition behaviors were measured by previous day's food intake (SPAN), perceived barriers to good nutrition, dietary importance and dietary self efficacy. Subjects were asked to answer nineteen questions on their food intake from the previous day. For example “Yesterday did you eat hamburger meat, hot dogs, sausage (chorizo), steak, bacon or ribs?” In every case examples were given that represent the “American” and “Mexican” diet (i.e. potato chips, tortillas, fried chicken, milanesa, etc). Two variables were created from these questions. Foods such as fried foods, soft drinks, pastries, and white bread were scored as “unhealthy”. Foods such as vegetables, fruit, baked chicken and fish were scored as healthy. In total there was a total possible score of 30 for “unhealthy” and 27 for “healthy”. There were seven questions on barriers to good nutrition and participants were asked to rate their responses on a 5 point Likert scale from never to very frequently. For dietary importance, participants were asked nine questions on a five point Likert scale from not at all important to very important. Finally dietary self efficacy consisted of 10 items and participants were asked to rate their answers on a 5 point Likert scale from not sure to sure.

Social support items were derived from Sallis [15] measures of social support which were shown to have evidence of acceptable reliability and validity. Participants responded to the 10-item 5 point Likert scale designed to assess how much positive support they received from close friends and family on making good nutritional decisions. The household income variable was categorized as $0, $1-$300, and $301 or more. Education was categorized as 0, 1-5, 6-8, and 9 or more years of schooling. Finally, age, gender, and marital status were also assessed.

Analysis

Descriptive statistics were first generated to detect trends in the data and to assess if adjustments in the data would be needed to perform regression analysis. We determined that because of the lack of correlation between nativity and previous day's food intake and barriers to good nutrition, regression analysis would not be conducted for these outcome measures. Skewness tests were conducted for food importance (importance of eating 5 servings of fruits and vegetables per day) and dietary self-efficacy (ease of eating 5 servings of fruits and vegetables per day). Results indicated that a transformation would not be necessary and we could proceed with Ordinary Least Squares (OLS) without violating the normal distribution assumption. An OLS regression analysis was then conducted on food importance and dietary self-efficacy. A total of five models were conducted, including an interaction model with nativity, household income and education.

Results

Table 1 presents descriptive statistics for the outcome variables, demographic characteristics, and socioeconomic status by nativity. There was no significant difference between Mexico born Mexican Americans and US born Mexican Americans with respect to the previous day's intake of unhealthy or health foods. There was also not a difference for barriers to good nutrition. Dietary importance and dietary self-efficacy differed by nativity status. Mexico born Mexican Americans reported greater average dietary importance (mean 37.4 vs. 35.7, p=.008) and dietary self-efficacy (mean 45.2 vs 42.8, p=.002). With respect to demographic characteristics, a significant difference by nativity status in age was not found, but, Mexico born Mexican Americans were more likely to be female (87.0 vs. 77.7, p=.029). In addition, Mexico born Mexican Americans reported a greater tendency to make less than $300 a month (79% versus 64.9%, p=.003) and were more likely to have less than 6 years of education (42.0% versus 9.5%, p=.000). Finally, nutritional behavior social support did not vary by nativity status.

Table 2 presents OLS regression results for food importance in the TSSC sample. In the unadjusted model (model 1), US born Mexican Americans reported decreased dietary importance (β= -1.77 (*p* = .008). After adjusting for demographic characteristics (model 2), this relationship is attenuated slightly (β= -1.47, p=.024). After including socioeconomic status to the model, the coefficient for US born Mexican Americans increased (β= -2.36, p=.001), yet, in model 4 social support had little effect on the relationship between nativity and food importance. Despite the changes to the nativity coefficient in model 3, in model 5, interaction effects between nativity and socioeconomic status did not reveal any significant effects.

Table 3 shows the OLS regression results for dietary self-efficacy by nativity. Just as was observed in the previous table, Mexican American participants show lower overall dietary self-efficacy scores than their Mexican immigrant counterparts (β= -2.44, p=.002) and demographic characteristics do little to explain this relationship in model 2 (β= -2.31, p=.003). Unlike the previous table, however, there is little effect of socioeconomic status (model 3) on the relationship between nativity and dietary self-efficacy. In model 4, with the inclusion of nutritional behavior social support, although the coefficient is increased by .37 points, the strength of the association was affected very little as illustrated by the *p*-value. Interaction effects in model 5 demonstrate significant effects for household income and education. US born Mexican American participants that reported household income of $1-$300 a month on average scored 4.754 points less on dietary self-efficacy than Mexico born Mexican Americans without any monthly income. On the contrary, Mexico born Mexican Americans who reported $1-$300 a month on average scored .537 points more on the dietary self-efficacy scale than Mexico born Mexican Americans without any monthly income.

Additionally, with respect to education, US born Mexican American participants with no formal education on average scored 6.397 points less on the dietary self-efficacy scale than Mexico born Mexican Americans with at least a 9^{th} grade level of education. However, Mexico born Mexican Americans with no formal education on average only scored .496 points less than their Mexico born Mexican American peers with a ninth grade level of education or more.

Discussion

The purpose of this study was to expand our understanding of the relationship between immigration, nutritional beliefs, and behaviors in a sample of Mexican Americans living in the US-Mexico border region of South Texas. This study is unique in that it is one of very few studies that used data obtained from a region of the United States that is largely Hispanic and where acculturation is low in the general population. The findings from this study reveal that despite the language homogeneity that exists among Mexican Americans residing on the US-Mexico border, differences between US born Mexican Americans and Mexico born Mexican Americans remain in nutritional beliefs, but not in behaviors.

With respect to behaviors, these findings are contradictory to what has been observed in previous studies [17-18]. Using data from the NHANES 1999-2004, Duffy, Gordon-Larsen, Ayala, and Popkin found that, in Hispanics, immigrants differed significantly from US born Mexican Americans in their food choices. Mexico born Mexican Americans were more likely to eat beans, fruits and vegetables, and less likely to eat fast food or desserts in comparison to their US born Mexican American counterparts. On a regional level, other studies that have looked at nutritional behaviors have established a strong association with nativity [19-20]. In Washington state, immigrants who were more acculturated – measured as language use, country of birth and duration in the US – were less likely to eat fruits and vegetables (2004). Findings from the Arizona WISEWOMAN study of older women, also demonstrate a tendency for less acculturated women to have better nutritional behaviors than both their more acculturated and non-Hispanic white counterparts [20].

The findings from ours and other studies lends partial support to our first hypothesis that differences that exist between Mexico born Mexican Americans and US born Mexican Americans is a function of acculturation. In an environment where the majority of the population speaks Spanish and is heavily dominated by Mexican culture, Mexican Americans did not differ in terms of their nutritional behaviors. Nevertheless, contrary to our first hypothesis, Mexico born Mexican Americans were more likely to rate their dietary choices as important and had greater food self-efficacy than their US born Mexican American counterparts. What these divergent patterns suggest is that the relationship between nutrition, immigration and acculturation is complicated and although behaviors may change with time or exposure to the US mainstream culture, immigrants still maintain beliefs and ideals from Mexico that are different than US born Mexican Americans. Future research on acculturation and immigration should focus on understanding why behaviors change and interventions should center on ways to maintain the influence of beliefs on actual behavior despite lifestyle changes that may occur with adaptation to the United States.

In the multivariate regression models, differences between the US born and Mexico born Mexican Americans in food self-efficacy were changed when socioeconomic status was included, however, the effects remained significant. The interaction model reveals two important trends. First, income and education do not have the same directional effect on food self-efficacy. Greater income was associated with lower food efficacy, while higher education was associated with higher food self-efficacy. Second, these effects were only observed for the US born. These findings demonstrate the importance of separating income

and education when trying to understand the influences on socioeconomic status on nutritional beliefs as they may exert differential influences. In addition, the fact that Mexico born Mexican Americans did not demonstrate these same effects further supports the notion that ideals or customs that are brought from Mexico may not be easily changed and are affected very little socioeconomic experiences that may occur during their exposure to the United States. To our knowledge this is the first study to examine the interaction of socioeconomic status and nativity on food self efficacy in Mexican Americans. The closest study, using the NHANES data, researchers found that neighborhood socioeconomic status of a neighborhood was associated with an increased likelihood of fruit and vegetable intake [21]. Therefore, further research is indicated to better understand the nature of the relationship between socioeconomic status, immigration and nutritional beliefs in the Mexican American population.

The findings from this study are applicable to a specific sub-population of Mexico born Mexican Americans and US born Mexican Americans from the Texas-Mexico border region and the design of this study should be replicated to include a larger, more socioeconomically diverse sample of Mexican Americans living in the border region. In addition, because of the small sample size, statistical power was limited. Despite the limitations, this study adds to the current discussion on nativity and diet in Mexican Americans by demonstrating that socioeconomic status influences dietary beliefs in this population. Furthermore this study shows that regional variability in this relationship may exist among the Mexican American populations living in the United States and the need for more regional studies that address socioeconomic conditions of Hispanic sub-populations.

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Table 1
Descriptive Characteristics by Nativity Status for the TSSC Sample (n=394)

	US Born	Mexico Born	t, χ^2 (p-value)
Outcome Variables (mean (± S.D.))			
Previous Day's Food Intake			
Unhealthy Food	3.60 (1.93)	3.38 (2.43)	.780 (.436)
Healthy Food	4.47 (2.32)	4.65 (2.51)	.605 (.545)
Barriers to Good Nutrition	11.7 (5.0)	11.5 (4.8)	.223 (.823)
Dietary Importance	35.7 (7.0)	37.4 (5.1)	2.67 (.008)
Dietary Self Efficacy	42.8 (8.3)	45.2 (5.8)	3.95 (.002)
Demography Characteristics			
Age(mean ± (S.D.))	41.2 (19.4)	43.5 (15.6)	1.18 (.240)
Gender (%)			
Male	21 (22.3)	39 (13.0)	4.8 (.029)
Female	73 (77.7)	260 (87.0)	
Marital Status			
Married			
Not Married			
Socioeconomic Status			
Monthly Household Income (%)			
$0	48 (51.1)	152 (51.0)	12.0 (.002)
$1-300	13 (13.8)	84 (28.2)	
$301+	33 (35.1)	62 (20.8)	
Education (%)			
0	2 (2.1)	17 (5.7)	67.7 (.000)
1-5	7 (7.4)	109 (36.3)	
6-8	16 (17.0)	93 (31.0)	
9+	69 (73.4)	81 (27.0)	
Nutritional Behavior Social support (mean (±S.D.)) (~30 missing)	13.7 (7.7)	13.1 (7.8)	.58 (.563)

Table 2

OLS Regression Analysis Results for Nativity and Food Importance for the TSSC Sample (n=394)

	Model 1	Model 2	Model 3	Model 4	Model 5
Nativity (Mexico born Mexican American ref.)	-1.77 (.008) †	-1.47 (.024)	-2.36 (.001)	-2.26 (.001)	-1.25 (.284)
Demography Characteristics					
Age		-.011 (.519)	-.009 (.634)	-.011 (.580)	-.016 (.437)
Gender (female ref.)		3.66 (.000)	3.69 (.000)	3.44 (.000)	3.34 (.000)
Marital Status (married ref.)					
Socioeconomic Status					
Monthly Household Income ($0 ref.)					
$1-300			-1.62 (.025)	-1.64 (.027)	-1.39 (.084)
$301+			.613 (.390)	.507 (.492)	1.12 (.198)
Education (9+ ref.)					
0			-1.17 (.108)	-1.57 (.038)	-1.13 (.192)
1-5			-1.25 (.107)	-1.43 (.074)	-1.34 (.121)
6-8			-1.49 (.297)	-1.63 (.246)	-1.58 (.289)
Nutritional Behavior Social support				.019 (.603)	.013 (.733)
US born *Socioeconomic Status					
Monthly Household Income ($0 ref.)					
$1-300					-1.89 (.313)
$301+					-2.15 (.163)
Education (9+ ref.)					
0					-2.25 (.213)
1-5					.735 (.765)
6-8					2.41 (.565)
Constant	37.4 (.000)	34.7 (.000)	35.9 (.000)	36.0 (.000)	36.0 (.000)
R^2	.02	.07	.10	.10	.12

† (p-value)

Table

OLS Regression Analysis Results for Nativity and Food Self Efficacy for the TSSC Sample (n=394)

	Model 1	Model 2	Model 3	Model 4	Model 5
Nativity (US born Mexican American ref.)	-2.44 (.002) †	-2.31 (.003)	-2.53 (.003)	-2.90 (.001)	-.571 (.673)
Demography Characteristics					
Age		.001 (.960)	-.005 (.833)	.002 (.934)	-.001 (.981)
Gender (female ref.)		1.40 (.127)	1.23 (.174)	1.35 (.160)	1.19 (.215)
Marital Status (married ref.)					
Socioeconomic Status					
Monthly Household Income ($0 ref.)					
$1-300			-.370 (.662)	-.201 (.820)	.537 (.569)
$301+			1.26 (.130)	1.50 (.088)	1.65 (.109)
Education (9+ ref.)					
0			-1.55 (.069)	-1.68 (.062)	-.496 (.625)
1-5			1.08 (.232)	.836 (.379)	1.41 (.165)
6-8			.139 (.932)	.005 (.998)	.808 (.645)
Nutritional Behavior Social support				.012 (.789)	.012 (.786)
US born* Socioeconomic Status					
Monthly Household Income ($0 ref.)					
$1-300					-4.72 (.033)
$301+					-.923 (.611)
Education (9+ ref.)					
0					-5.33 (.012)
1-5					-.226 (.938)
6-8					-.771 (.875)
Constant	45.2 (.000)	43.9 (.000)	43.8 (.000)	43.9 (.000)	43.3 (.786)
R^2	.02	.03	.06	.07	.10

† (p-value)